## Blending is the key – valorization of side streams in FERBLEND



## Introduction

Synergistic effects can be used to get the most out of two side streams. In this project we blend whey and sunflower press cake to compensate for disadvantages of the individual by-products. Through fermentation and pre-processing, new food products are created.

## Article Body

The aim of FERBLEND is to find ways to re-use two valuable by-products of the food processing chain, namely sunflower press cake and whey, after further pre-processing and subsequent fermentation. Sunflower press cake is a nutritious raw material with approx. 30-50 g/100 g protein. Up to date, especially in smaller production scale, this by-product is only used as animal feed or for soil fertilisation and is therefore lost for human nutrition. The challenge concerning the valorisation of press cake is its high dietary fibre content, which often hinders its application in protein rich foods, and which is responsible for its poor sensory properties.



With FERBLEND we aim to tackle this challenge by blending two side streams, sunflower press cake from organic oil production and sweet whey from rennet cheese manufacture. Through combined fermentation – press cake serves as protein source and whey as carbohydrate source – new platform products shall be created for further use in various foods by improving technological and nutritional functionality of the blends. The use of various methods of pre-treatment allowed to shape the technological and functional properties of sunflower seed cake and whey protein. One of these possible pre-treatments is the removal of fibre-rich hulls from milled press cake by using pneumatic separation.

Pneumatic separation with a zig-zag classifier to dry fractionate sunflower press cake into fibre-rich and protein-rich powders (credit: S. Morejón-Caraballo).

For the implementation of a fermentation procedure, a collection of thirty different microbial strains (18 lactic acid bacteria (LAB) and 12 yeasts) isolated from homemade or industrial samples of acidified milk or sugary kefir and from press cake have been identified and screened by growth kinetics, phenotypic characteristics and adaptability for being used in co-cultivations (1 LAB/1 yeast). The individual fermentation experiments were monitored through chemical (pH, acidity, organic acids, polyphenols) and microbiological parameters (plate counts of main microbial groups). The results allowed validating a controlled fermentation model with 4 selected strains that showed a fast acidification of the substrate to achieve food safety and good performance to limit spoilage microorganisms.



Set-up of sensory testing of fermented products to evaluate the aroma profile of the selected microorganisms (credit: R. Foschino).

The fermented blends are post-processed to improve product characteristic and create stable extruded products, spreads and drinks. The fermented blends are now undergoing sensory evaluation. And we can already tell you, things start to taste good!

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